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(12) United States Patent
Vacanti et al.**(10) Patent No.: US 6,348,069 B1**
(45) Date of Patent: Feb. 19, 2002**(54) ENGINEERING OF STRONG, PLIABLE TISSUES****(75) Inventors:** Joseph P. Vacanti, Winchester;
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Corporation, Boston, MA (US)**(*) Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.**(21) Appl. No.:** 09/185,360**(22) Filed:** Nov. 3, 1998**Related U.S. Application Data****(62)** Division of application No. 08/445,280, filed on May 19,
1995, now Pat. No. 5,855,610.**(51) Int. Cl.⁷** A61F 2/02**(52) U.S. Cl.** 623/11.11**(58) Field of Search** 623/1, 11, 12,
623/66; 424/424, 425, 426**(56) References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—David J Isabella*(74) Attorney, Agent, or Firm*—Holland & Knight LLP**(57) ABSTRACT**

It has been discovered that improved yields of engineered tissue following implantation, and engineered tissue having enhanced mechanical strength and flexibility or pliability, can be obtained by implantation, preferably subcutaneously, of a fibrous polymeric matrix for a period of time sufficient to obtain ingrowth of fibrous tissue and/or blood vessels, which is the removed for subsequent implantation at the site where the implant is desired. The matrix is optionally seeded prior to the first implantation, after ingrowth of the fibrous tissue, or at the time of reimplantation. The time required for fibrous ingrowth typically ranges from days to weeks. The method is particularly useful in making valves and tubular structures, especially heart valves and blood vessels.

7 Claims, No Drawings